

# WHAT IS CLAIMED IS

1. A non-aqueous electrolytic solution secondary battery where an electrode group having a positive electrode, a negative electrode and a separator, connecting portions which connect to respective terminals from the electrode group, and a non-aqueous electrolytic solution are accommodated in a battery container provided with an internal pressure releasing mechanism which releases internal pressure at a predetermined pressure and where the positive electrode is constituted by applying a positive electrode active material mixture including lithium-manganese complex oxide and conductive material on both surfaces of a foil-shaped positive electrode collector, and the negative electrode is constituted by applying a negative electrode active material mixture including carbon material on both surfaces of a foil-shaped negative electrode collector, wherein the lithium-manganese complex oxide is set such that an amount of elution of manganese into the non-aqueous electrolytic solution is 5% or less on the basis of the lithium-manganese complex oxide in a range where an electrode potential to metal lithium is 4.8V or more, and the carbon material is graphite in/from which lithium ions can be occluded/released according to charging/discharging.

2. A non-aqueous electrolytic solution secondary battery according to claim 1, wherein a Li/Mn composition ratio in the lithium-manganese complex oxide is in a range of from 0.55 to 0.60.

3. A non-aqueous electrolytic solution secondary battery according to claim 2, wherein the carbon material is graphite, and the amount of elution of manganese of the lithium-manganese complex oxide into the non-aqueous electrolytic solution is 3.2% or less on the basis of the lithium-manganese complex oxide.

4. A non-aqueous electrolytic solution secondary battery according to claim 1, wherein the lithium-manganese complex oxide is lithium manganate.

5. A non-aqueous electrolytic solution secondary battery according to claim 1, wherein the lithium-manganese complex oxide is selected such that a half band width change of main diffraction light due to X-ray diffraction between SOC 0% and SOC 100% is 25% or less.

6. A non-aqueous electrolytic solution secondary battery according to claim 5, wherein a Li/Mn composition ratio of the lithium-manganese complex oxide is in a range of from 0.55 to 0.60.

7. A non-aqueous electrolytic solution secondary battery according to claim 5, wherein the lithium-manganese complex oxide is prepared by substituting a metal element for a portion of manganese.

8. A non-aqueous electrolytic solution secondary battery

according to claim 5, wherein the lithium-manganese complex oxide has a spinel crystallization structure.

9. A non-aqueous electrolytic solution secondary battery  
5 according to claim 5, wherein the lithium-manganese complex oxide is expressed by a chemical formula  $\text{Li}_{1+x}\text{Mn}_{2-x}\text{O}_4$ .

10. A non-aqueous electrolytic solution secondary battery  
10 according to claim 5, wherein the lithium-manganese complex oxide is expressed by a chemical formula  $\text{Li}_{1+x}\text{M}_y\text{Mn}_{2-x-y}\text{O}_4$ .

11. A non-aqueous electrolytic solution secondary battery where an electrode group having a positive electrode, a negative electrode and a separator, connecting portions which connect to respective terminals  
15 from the electrode group, and a non-aqueous electrolytic solution are accommodated in a battery container provided with an internal pressure releasing mechanism which releases internal pressure at a predetermined pressure and where the positive electrode is constituted by applying a positive electrode active material mixture including  
20 lithium-manganese complex oxide and conductive material on both surfaces of a foil-shaped positive electrode collector, and the negative electrode is constituted by applying a negative electrode active material mixture including carbon material on both surfaces of a foil-shaped negative electrode collector, wherein the  
25 lithium-manganese complex oxide is set such that an amount of elution

of manganese into the non-aqueous electrolytic solution is 7% or less on the basis of the lithium-manganese complex oxide in a range where an electrode potential to metal lithium is 4.8V or more, and the carbon material is amorphous carbon in/from which lithium ions can be occluded/released according to charging/discharging.

12. A non-aqueous electrolytic solution secondary battery according to claim 11, wherein a Li/Mn composition ratio in the lithium-manganese complex oxide is in a range of from 0.55 to 0.60.

13. A non-aqueous electrolytic solution secondary battery according to claim 12, wherein the carbon material is amorphous carbon, and the amount of elution of manganese of the lithium-manganese complex oxide into the non-aqueous electrolytic solution is 3.2% or less on the basis of the lithium-manganese complex oxide.

14. A non-aqueous electrolytic solution secondary battery according to claim 11, wherein the lithium-manganese complex oxide is lithium manganate.

15. A non-aqueous electrolytic solution secondary battery according to claim 11, wherein the lithium-manganese complex oxide is selected such that a half band width change of main diffraction light due to X-ray diffraction between SOC 0% and SOC 100% is 25% or less.

16. A non-aqueous electrolytic solution secondary battery according to claim 15, wherein a Li/Mn composition ratio of the lithium-manganese complex oxide is in a range of from 0.55 to 0.60.

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17. A non-aqueous electrolytic solution secondary battery according to claim 15, wherein the lithium-manganese complex oxide is prepared by substituting a metal element for a portion of manganese.

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18. A non-aqueous electrolytic solution secondary battery according to claim 15, wherein the lithium-manganese complex oxide has a spinel crystallization structure.

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19. A non-aqueous electrolytic solution secondary battery according to claim 15, wherein the lithium-manganese complex oxide is expressed by a chemical formula  $\text{Li}_{1+x}\text{Mn}_{2-x}\text{O}_4$ .

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20. A non-aqueous electrolytic solution secondary battery according to claim 15, wherein the lithium-manganese complex oxide is expressed by a chemical formula  $\text{Li}_{1+x}\text{M}_y\text{Mn}_{2-x-y}\text{O}_4$ .